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FARMERS' BULLETIN No. 1558

PREPARATION OF EASTERN GRAPES *for* MARKET



EASTERN-TYPE grapes are sold for both table and juice purposes. They are shipped from many places, but the largest supplies are received from New York, Pennsylvania, and Michigan.

The successful delivery to the consumer of eastern grapes depends largely on the care expended in their preparation for market and the subsequent handling from the time they are packed until they reach the market.

This bulletin describes the harvesting, packing, and handling of eastern grapes for market. These methods have been successfully employed by commercial growers in the various important producing sections.

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PREPARATION OF EASTERN GRAPES FOR MARKET

By B. E. SHAFFER, formerly *investigator in marketing, Division of Fruits and Vegetables, Bureau of Agricultural Economics*

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LEADING PRODUCING SECTIONS

EASTERN TYPE grapes are produced commercially in at least seven States, but by far the greatest concentration is found in the Chautauqua and Finger Lakes sections of New York, in the Benton Harbor and Paw Paw districts of southwestern Michigan, and in Erie County, Pa. Figure 1 shows the location of the chief grape-shipping districts, and table 1 gives an approximate idea of their relative importance, although each year an increasingly large volume is shipped from the eastern districts by motor truck.

For purposes of comparison the carload-shipment figures from California are also given, although grape production in that State is confined almost exclusively to the vinifera or European varieties. A much greater proportion of the California commercial crop is moved in carloads than is the case in the eastern districts, where there is an extensive motor-truck movement.

TABLE 1.—*Carload shipments of grapes, by States of origin, 1935*

State	Ship- ments	State	Ship- ments
	<i>Cars</i>		<i>Cars</i>
California.....	31,938	Kansas.....	50
New York.....	750	Missouri.....	41
Pennsylvania.....	404	Ohio.....	2
Michigan.....	227	Delaware.....	0
Iowa.....	165	All other.....	18
Arkansas.....	125		
Washington.....	83	Total.....	33,881
Arizona.....	78		

COMMERCIAL VARIETIES

The leading commercial varieties of the eastern type are Concord, Niagara, Catawba, Delaware, Moore, Worden, and Champion. Of

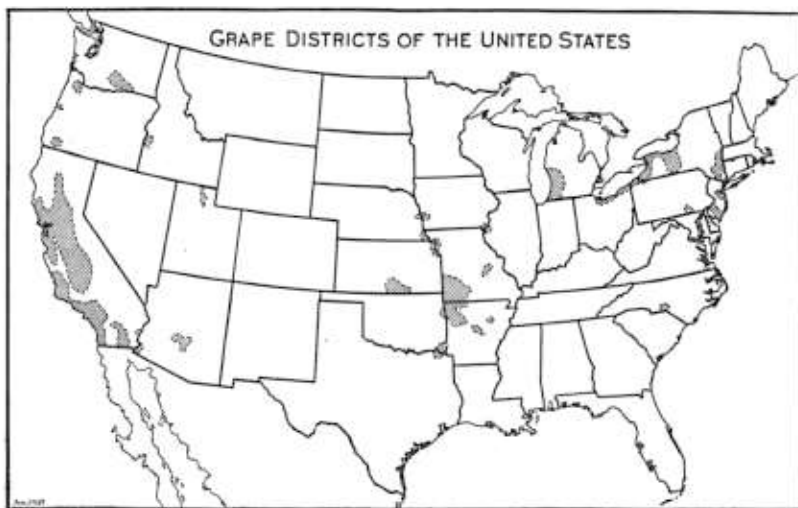


FIGURE 1.—The grapes grown in California and Arizona are almost entirely of the vinifera or European type. Native American grapes are grown in the other important districts. A large percentage of the crops of Michigan, New York, Pennsylvania, New Jersey, and Delaware are moved by motor truck.



FIGURE 2.—Picking grapes. Note type of picking bench used and method of cutting bunches of grapes.

these the Concord is most important. A few wine grapes such as Ives and Elvira are grown to a limited extent in the central lake district of New York. Other varieties of eastern grapes find their way into trade channels, but their production is not commercially important.

HARVESTING AND PACKING

TIME OF PICKING

The proper stage of maturity for picking grapes may be judged with sufficient accuracy for commercial purpose by the color and taste. When the grapes have attained full color for their variety and have developed enough sugar to be palatable they are ready to harvest. No other test for maturity of eastern grapes is used since no physical



FIGURE 3.—A common type of picking bench. The long top holds four 4-quart baskets.

test capable of giving more reliable results has been developed. The use of the hydrometer in connection with what is popularly called the "sugar test", but which actually shows the percentage of soluble solids in the juice, is common in California. It is used there in connection with the enforcement of maturity standards for European varieties, but, depending on climatic conditions, eastern-type grapes of the same variety and approximately the same degree of maturity may show a variation of several degrees in hydrometer readings.

PICKING

The operation of picking must be performed with great care, especially when fancy table grapes are being put up. The bunches are easily crushed and bruised by rough handling, and damp berries

soon mold and decay, especially in warm weather. Shears or clippers are used to cut the clusters from the vines (fig. 2). Ordinarily the grapes are placed directly in Climax baskets, which are the usual shipping containers. The fancy packs are placed in 2-quart and 4-quart baskets. For the lower grades the 12-quart size is used.

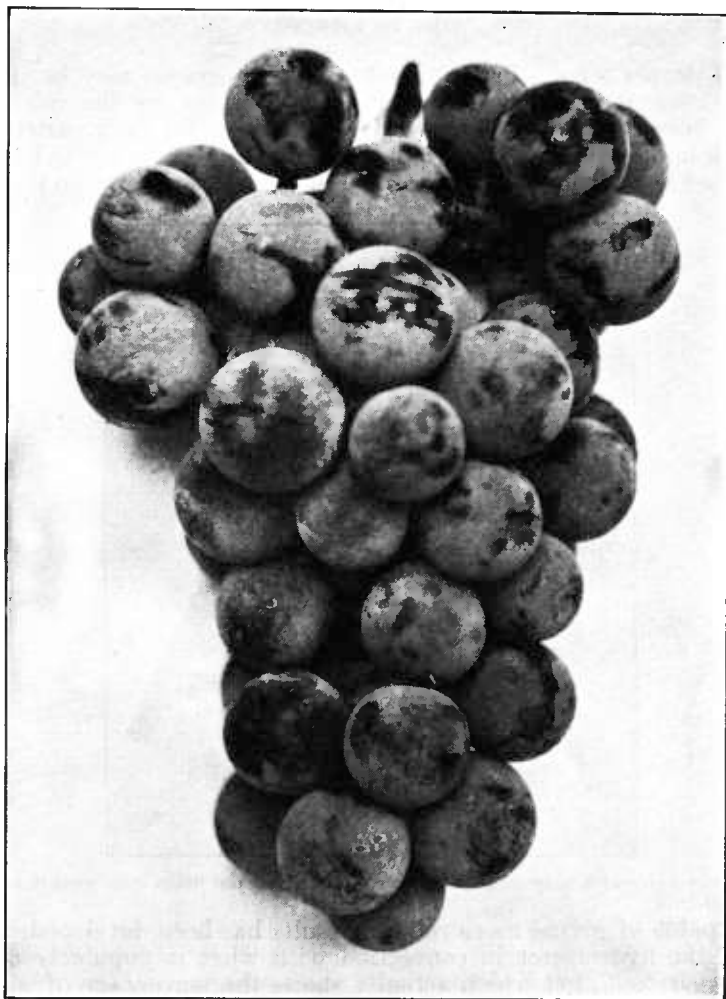


FIGURE 4.—Quality of stock desired in the highest grade, U. S. Fancy.

Field benches are used in picking and packing (fig. 2). These benches are usually made by the growers, although a few commercially manufactured benches are in use in the New York and Pennsylvania districts.

A well-designed bench should be rigidly constructed of light material and have the legs spread far enough apart to insure steadiness on the soft and more or less uneven ground in the vineyard. Thirty

inches is about the right height. The top should be about 16 inches wide and long enough to hold at least three baskets.

PACKING

Eastern grapes are usually packed in the vineyard. The best type of bench for the purpose is shown in figure 3. It accommodates four baskets, and the sloping position in which they are held facili-

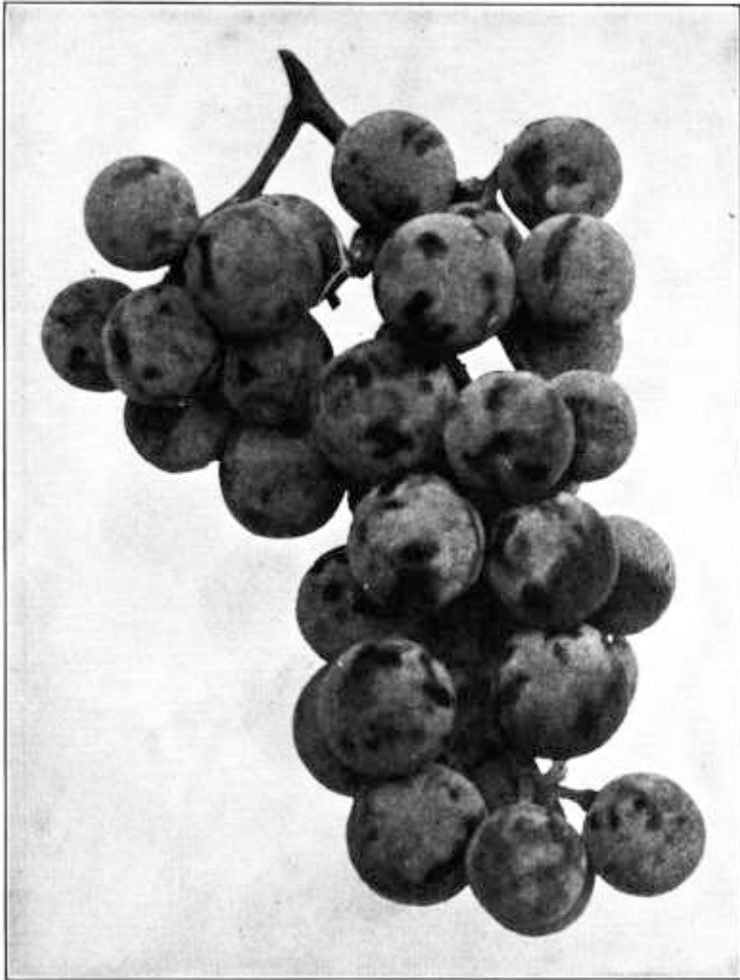


FIGURE 5.—Quality of stock to be expected in a good average grade, U. S., No. 1.

tates packing. By means of this arrangement three grades may be packed and the extra basket used for the culls. Typical U. S. Fancy, U. S. No. 1, and U. S. No. 1 Juice bunches are shown in figures 4, 5, and 6. Such grading is practicable only when the vineyard run is of good quality and the grapes are plentiful. In seasons of poor yields the picker seldom uses a stand or carries more than one basket. Under such circumstances proper grading is practically out of the question.

To start the pack correctly the lower end of the basket should be filled first, as shown in figure 7. The package is then filled carefully and snugly to a height of about 1 inch above the top of the basket.

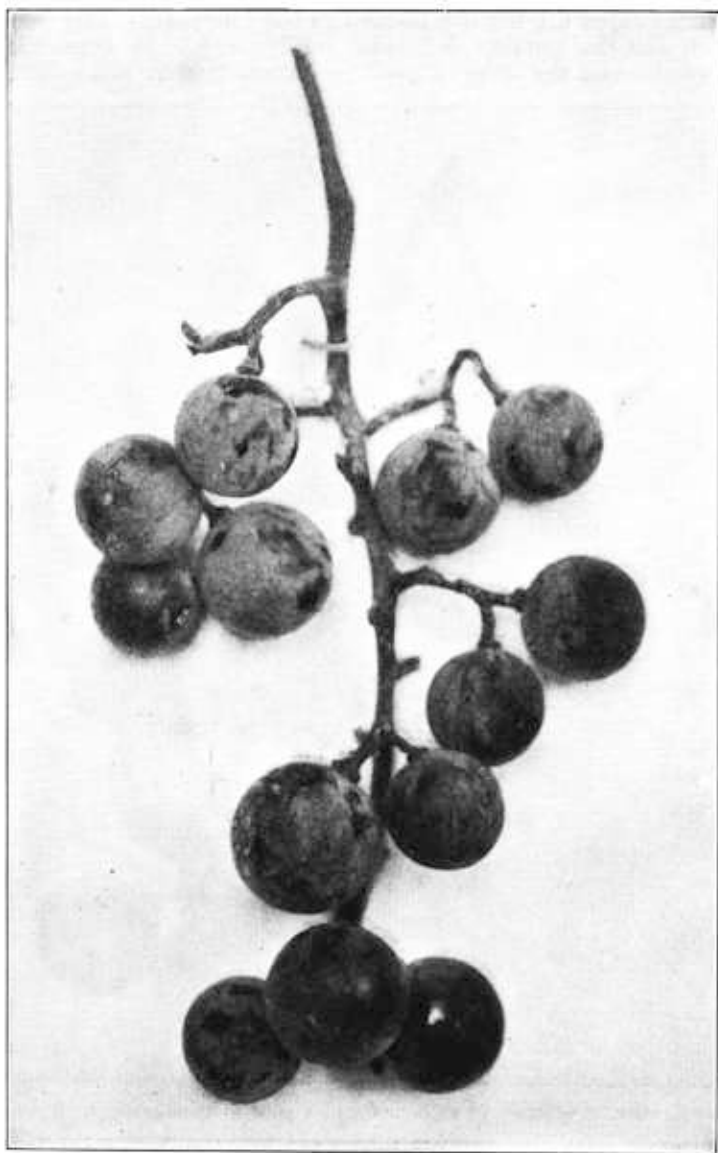


FIGURE 6.—Quality of stock usually found in the lowest grade (U. S. No. 1 Juice) of eastern grapes. Such stock should not be packed for table use.

The top of the grapes should be level (fig. 8). All stems should be concealed, and openings between the large bunches should be filled with smaller bunches. A full pack may thus be secured without danger of crushing the berries. The lids should not be put on until

the stems wilt, for the wilting permits the bunches to settle. The best vineyard packers remove the baskets from the vineyards on flat-topped wagons that hold but a single layer of baskets. After sufficient time has elapsed to permit the wilting of the stems the packs are inspected, slack packages are filled, and the lids are adjusted.

Some growers erect a temporary structure, protected by a board or canvas roof and equipped with flat-topped tables, in which to inspect and lid the baskets.

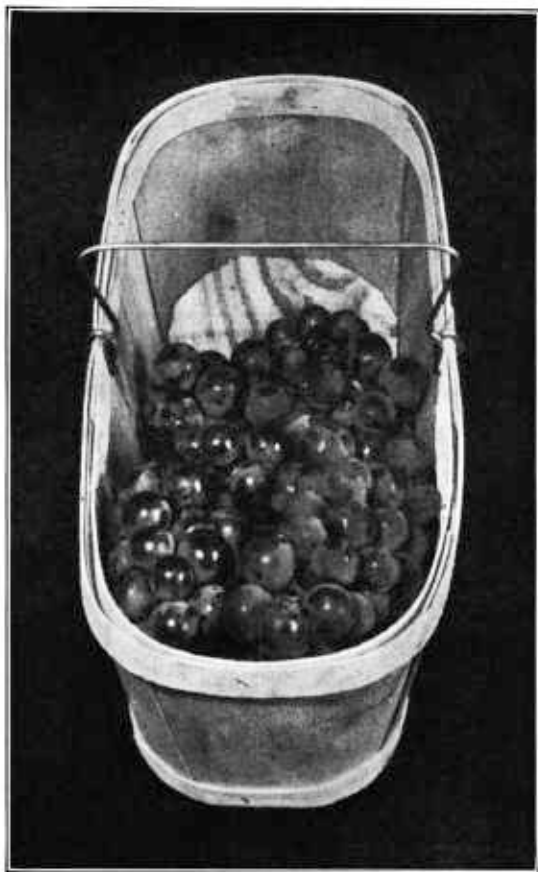


FIGURE 7.—To pack a basket properly first fill the lower end of the tilted basket, finishing the top evenly, with all stems concealed when the packing operation is completed.

Every effort should be made to avoid the necessity of repacking, for each time the bunches are handled there is danger of bruising and cracking the berries and of destroying the characteristic attractive bloom. Crushing is certain to result if the bunches project too far above the top, as in figure 9. If grapes are crushed in hot weather frequently mold develops within a few hours. During such periods it is highly important to place the fruit in a cool place as soon as possible after packing.

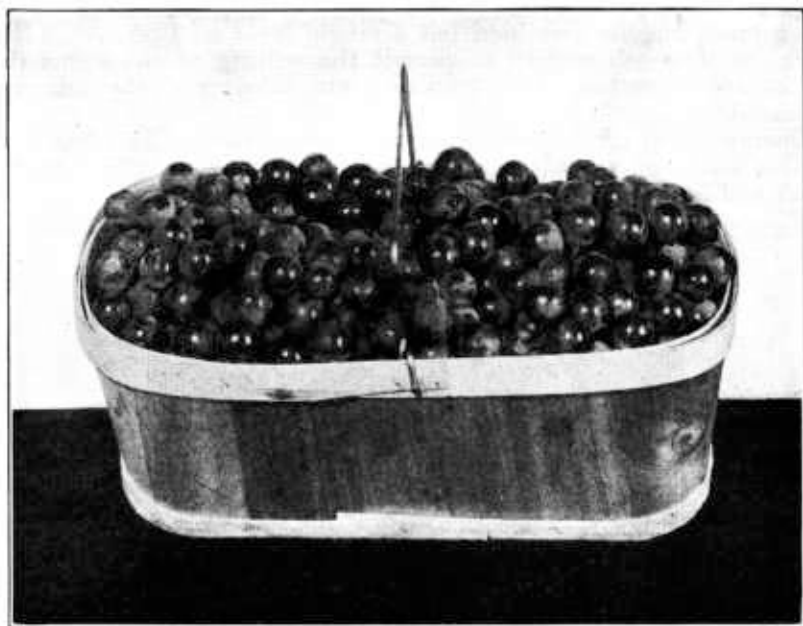


FIGURE 8.—A properly packed basket with an even surface.

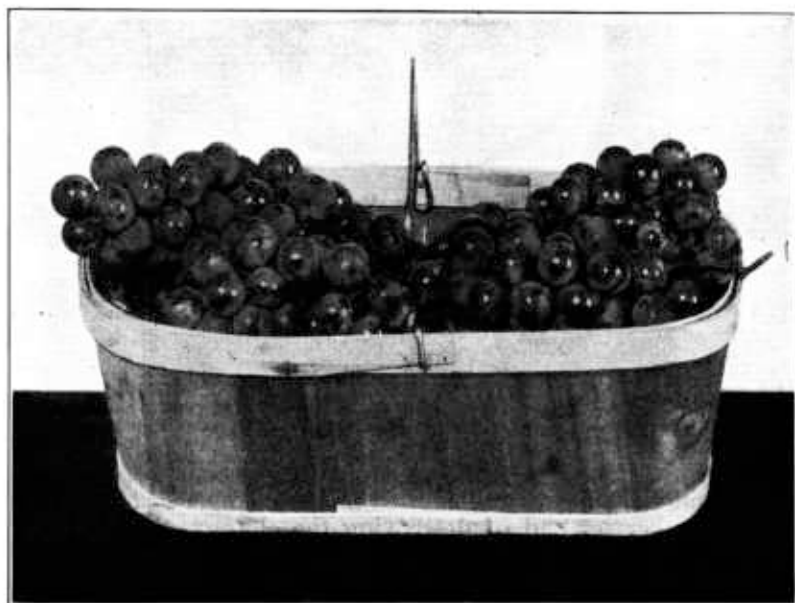


FIGURE 9.—An improperly packed basket. When covers are placed on a basket packed in this way many berries are bruised, and considerable decay often results.

Late in the fall many of the most successful growers in New York, Pennsylvania, and Washington place their grapes in storage and pack them later in a packing house. Grapes that are to be stored and packed later should be picked with great care and placed with the stems up in field boxes of the type shown in figures 10, 11, and 12. If the grapes are handled in this way, the marketing season may be extended from 3 to 4 weeks without injury to the fruit.

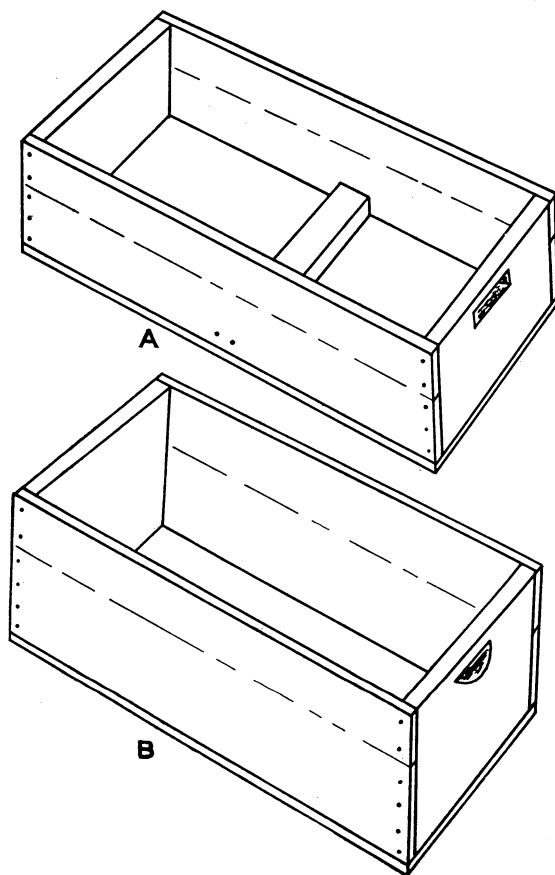


FIGURE 10.—A, Type of field picking tray in most common use. Outside dimensions, 24 by 12 by 6 inches. B, Type of field picking tray used to a limited extent. Same dimensions as A, except that it is 2 inches deeper.

Grapes are stored at temperatures ranging from 32° to 50° F. Careful attention should be given to the humidity of the storage chamber to preserve the fresh, plump appearance of the berries. Some growers sprinkle the grapes, but this practice is not recommended unless it is carried on under the supervision of an experienced person.

The finest packs of table grapes are put up in packing houses. The packers employed in these houses operate under almost ideal conditions which facilitate the putting up of a good pack. They are provided with clippers for removing all crushed, cracked, and

blemished berries as well as any long, unsightly stems. The stems of the bunches of grapes to be packed in these houses are always allowed to wilt before the grapes are delivered to the packers. This makes it possible to bend the bunches to conform to the available space without cracking or bruising the berries. Much care is exercised in securing an even and attractive top and a tight pack.

There are several types of packing houses, one of which is shown in figure 13. Here the grapes are delivered at the receiving door and trucked to the packing tables. When empty, the field boxes are stacked on the platform at the end of the house to be returned to the

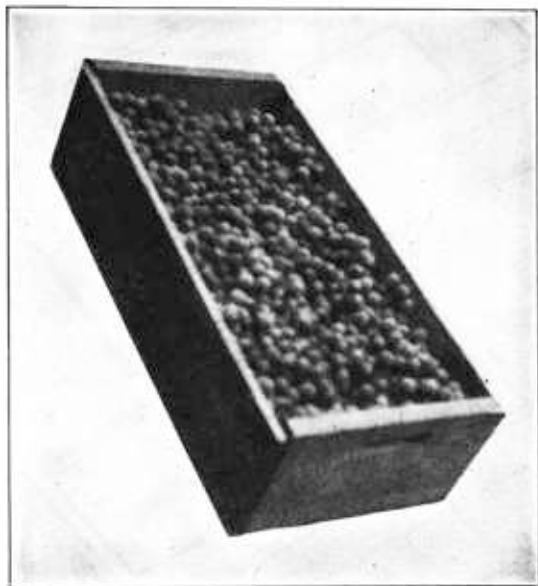


FIGURE 11.—Tray properly filled with grapes. These grapes will not be bruised when trays are stacked one on top of another.

growers. The packed baskets are then trucked (fig. 14) to the loading platform to be loaded into the cars.

Empty baskets are stored in the second story of the building and are delivered to the packers through chutes.

Several types of packing benches are used. Figures 15 and 16 show the most practical type, although some packers like the bench illustrated in figure 12. The only difference in the tables shown in figures 15 and 16 is the size of the unit.

Some packers place an attractive colored pad under the cover and place a label on the cover. A convenient labeling machine is shown in figure 17. The paste is placed on the basket cover by drawing it over the roller, after which the label is placed. An experienced operator can paste 4,000 to 6,000 labels a day with this device.

PACKAGES

Climax baskets are standardized, under the provisions of the United States Standard Container Act, in three sizes—2-quart, 4-quart, and 12-quart (fig. 18). The first two are used for the table-



FIGURE 12.—Single-unit packing table. The box on the floor is for cull grapes.

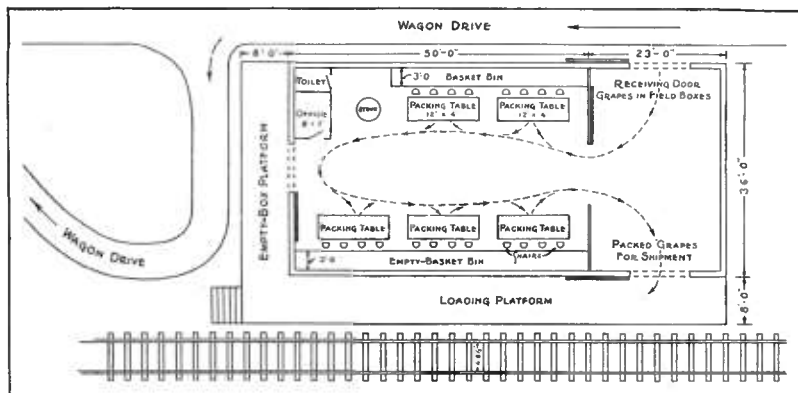


FIGURE 13.—Floor plan of grape-packing house. Note arrangement of packing tables, packers' chairs, and basket bins.

grape packs. Within the last few years several types of wire handles have practically replaced the wooden handles formerly used.

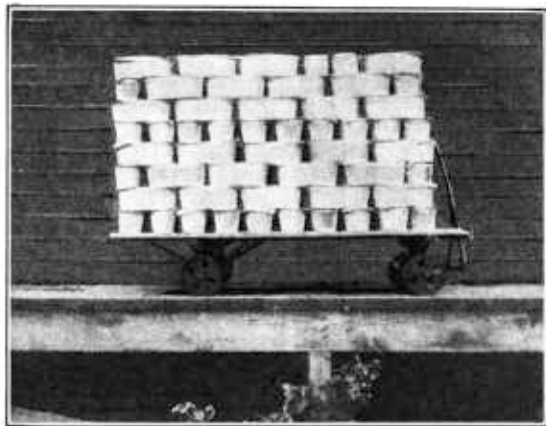


FIGURE 14.—Hauling packed 2-quart baskets from packing room to the car. Note method of stacking baskets on truck.

In some sections, a strong, ventilated, corrugated carton containing twelve 2-quart, wood-veneer till baskets is used to a considerable

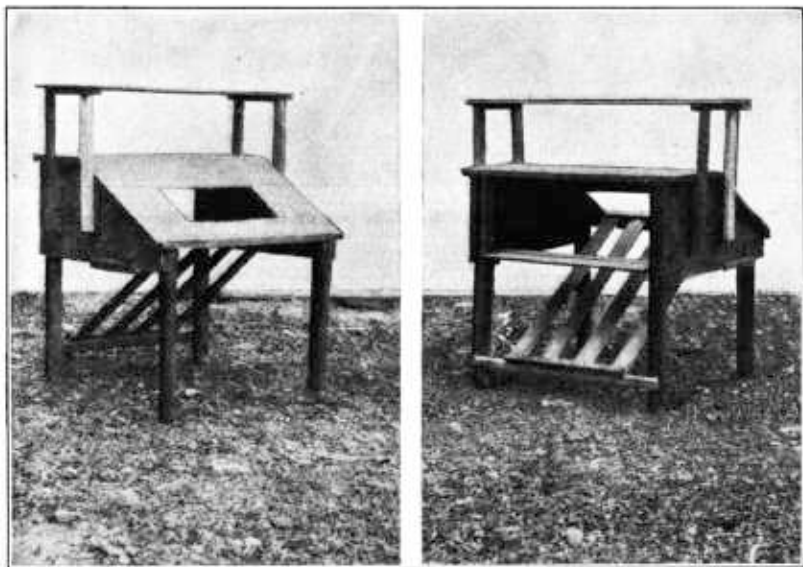


FIGURE 15.—Front and rear views of a one-unit packing table. Grapes are placed under the shelf on top of the table by the tender and are pulled forward by the packer. The lug containing cull grapes is pushed down through the hole to the rear of the table. Packed baskets are placed on the shelf above the table, from which position they are removed by the tender.

extent for table grapes. The baskets are packed in two or three layers, which are separated by a sheet of corrugated cardboard supported by the wire handles of the layers beneath.

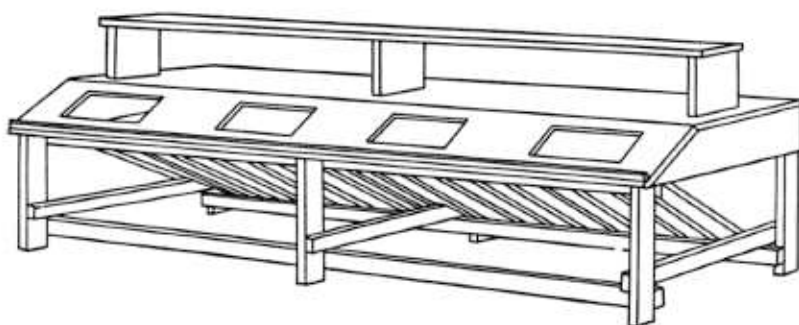


FIGURE 16.—Four-unit packing table. This is the most practical size.

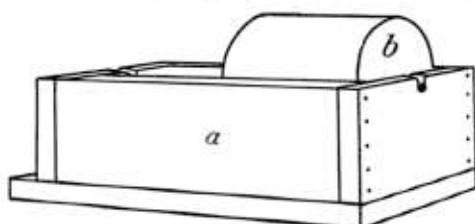


FIGURE 17.—Labeling machine consisting of (a) metal-lined watertight box and (b) cloth-covered roller.

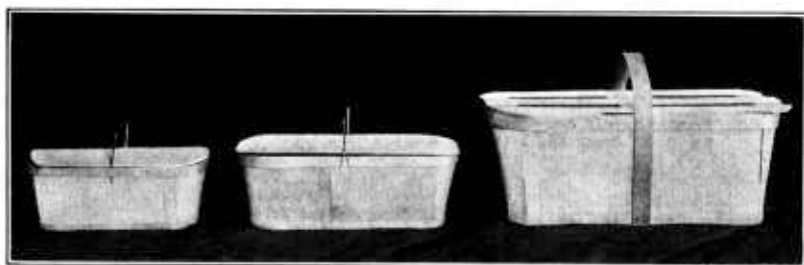


FIGURE 18.—Most eastern grapes are marketed in standardized Climax baskets, which are made in 2-, 4-, and 12-quart sizes.

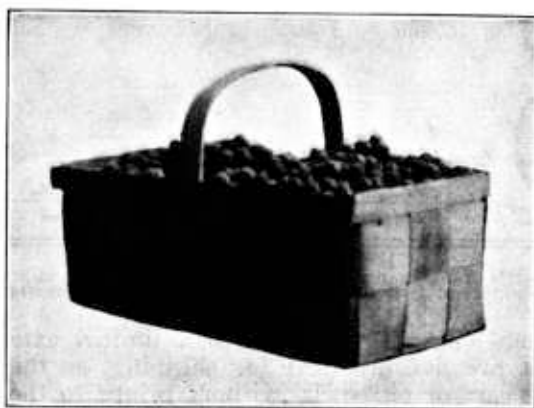


FIGURE 19.—Twelve-quart square-cornered splint basket used at a few local markets. Grapes are seldom shipped in this type of container.

Every year some grapes are shipped in bushel round stave baskets although this package is wholly unsuited to grapes. The fruit so shipped invariably arrives on the market in a crushed and leaky condition.


F. P. I.—1a UNITED STATES DEPARTMENT OF AGRICULTURE BUREAU OF AGRICULTURAL ECONOMICS	
B 257345	INSPECTION CERTIFICATE
<small>This certificate is admissible in all Courts of the United States as prima facie evidence of the truth of the statement therein contained. This certificate does not excuse failure to comply with any of the regulatory laws enforced by the United States Department of Agriculture.</small>	
Market <u>Philadelphia, Pa.</u> , Date <u>Oct. 18, 1935</u> Hour <u>1:30 P.M.</u>	
To <u>John Doe</u> <small>(Applicant)</small>	Address <u>Philadelphia, Pa.</u>
Shipper <u>Richard Roe</u>	Address <u>Silver Creek, N. Y.</u>
Receiver <u>John Doe</u>	Address <u>Philadelphia, Pa.</u>
<small>I certify that in compliance with the regulations of the Secretary of Agriculture governing the inspection of various products pursuant to the Act making appropriations for the United States Department of Agriculture, I inspected, at the time and on the date stated above, samples believed by me to be representative of the following lot of products, and that the quality and/or condition as shown by said samples, at said time and on said date, were as stated below:</small>	
Car initials and number <u>M.D.T. 156112</u>	Kind of car <u>Refrigerator</u>
Where inspected <u>B & O Terminal</u>	
Condition of car: <u>Doors closed, hatch covers raised to 30° angle, plugs out; bunkers empty.</u>	
Products inspected and <u>Concord GRAPES in 12-qt. climax baskets stamped "U. S. No. 1 distinguishing marks: Table Grapes".</u>	
Condition of load and containers: <u>Loaded full length of car 10 rows wide, 6 layers high with exception of 2 rows which are 7 layers high.</u>	
Condition of pack: <u>Generally tight.</u>	
Temperature of product: <u>Between doors top 44° F., bottom 43° F.; bunkers top 43° F.</u>	
Size: <u>Berries generally medium, few small. Less than 10% under 9/16 inch in diameter. Bunches generally small to medium size.</u>	
Quality: <u>Berries are generally well colored; generally firmly attached to capstems. Bunches fairly compact to compact. Stems green to turning brown. Defects for U. S. Grade No. 1 (table) average 5% chiefly shattered berries.</u>	
Condition: <u>Generally firm. Less than 1% decay. Blue Mold Rot.</u>	
Grade: <u>U. S. No. 1 Table.</u>	
<u>Reanalyzed</u>	
	Fee _____ Expenses _____ Total _____
G. R. BLOUNT PHILADELPHIA, PA. <small>Inspector.</small>	
<small>PLEASE REFER TO THIS CERTIFICATE BY NUMBER AND MARKET</small>	

FIGURE 20.—Facsimile of a farm-products inspection certificate such as is issued by United States inspectors of food products. Note the detailed information given.

Splint baskets (fig. 19) are used to a limited extent for local marketing but are not practical for shipping, as they cannot be stacked in the cars or on trucks without injury to the grapes.

Late in the season juice grapes are sometimes shipped in field picking boxes. These boxes are returned after the grapes are sold.

Only a few shippers have found this practice satisfactory. The Climax basket is in almost universal use for shipping eastern grapes.

STANDARDIZATION AND INSPECTION

United States grades and standards for eastern grapes are in general use. These standards define in detail the requirements of the various grades and specify the tolerances for defective grapes

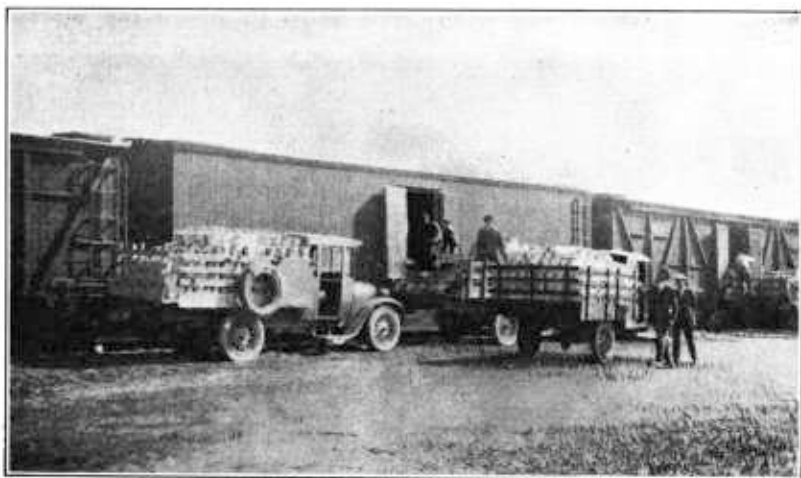


FIGURE 21.—Loading grapes into cars.

that may be allowed in the grades. In general terms, the grades provide for a premium grade of table stock known as U. S. Fancy,

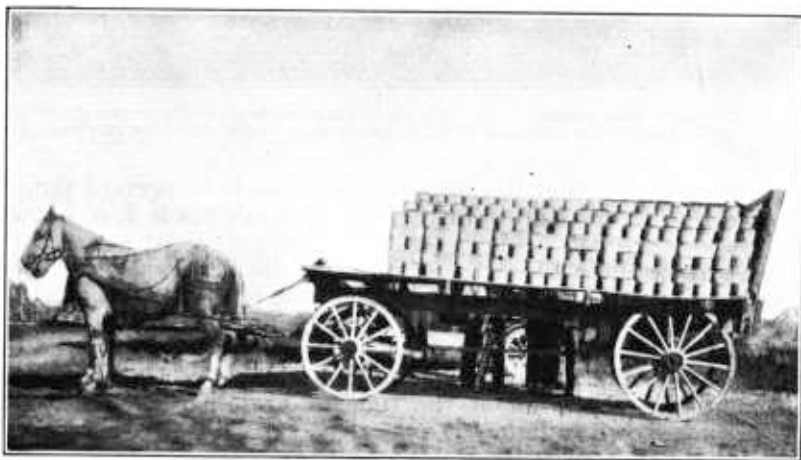


FIGURE 22.—Hauling packed 4-quart baskets from vineyard to cars. A flat rack is used on the wagon.

a first-class commercial pack of table grapes, U. S. No. 1, and a third grade of stock which is of inferior appearance but which is suitable for shipment for juice or other purposes. This grade is U. S. No. 1 Juice.

As the specifications of these grades are subject to change they are not given in this bulletin. Copies of the latest recommendations may always be obtained without charge from the Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

Standard grades serve as a common language between shipper and distant buyer and constitute a basis of quoting sales which is understood throughout the industry. Their general use establishes confidence among buyers and sellers and helps to widen the markets.



FIGURE 23.—Good, snug loading. The only place where baskets should be placed crosswise of the car is next to the bulkhead to fill in spaces that would otherwise be vacant (note A and B).

Inspection for grade at the shipping point tends to prevent unjustified rejection at destination in the case of a sale made f. o. b. usual terms.

The United States Department of Agriculture provides an official inspection service in the leading markets and, in cooperation with the States, at most of the important shipping points. Inspections are made only on application. A small fee is charged to cover the cost of the service, and certificates are issued which describe the quality and condition of the lot at the time of examination. A typical certificate is shown in figure 20.

LOADING

The successful delivery of grapes to the market depends upon the care with which they are loaded on trucks and wagons and in the cars. Properly loaded trucks and wagons are shown in figures

21 and 22. The surface upon which the bottom layer rests should be smooth, and the top layers should be stacked squarely on the bottom ones, with no unnecessary space between the stacks to allow shifting.

The correct method of loading a car of Climax baskets is shown in figures 23, 24, and 25. Figure 23 shows how the "straight" system is started; figure 24 shows the completed row. Any extra

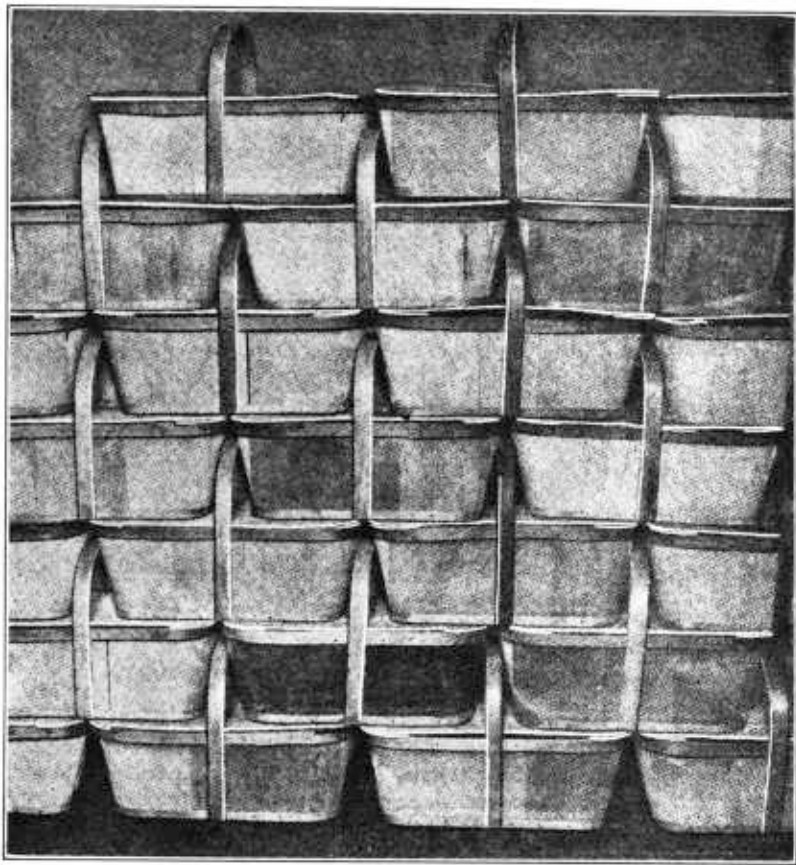


FIGURE 24.—"Straight" system of loading. The baskets are well placed, and there is no surplus space between them.

space at the end of the car must be taken up by constructing a bulkhead, whereas extra space at the side of the car may be filled by placing the last row in a diagonal position, as shown started in figure 25. This row is often referred to as "the worm." Baskets should never be loaded crosswise of the car except as shown in figure 23, *A* and *B*.

All uneven places on the car floor should be leveled before the car is loaded.

GRAPES FOR JUICE FACTORIES

Grapes picked for delivery to juice factories should be well colored and should be high in sugar content. The most careful manufacturers have the decayed and insect-injured berries removed before the fruit is placed in the presses.



FIGURE 25.—“Diagonal” system of loading used in the last row loaded to take up extra space at the side of the car.

CORRECT METHODS SIMPLE BUT IMPORTANT

The foregoing discussion indicates that the requirements for packing eastern table grapes are relatively simple. This is true, but they must be followed with care if a high-class product is to be packed. The greater ease in meeting the comparatively low packing requirements for juice stock has reacted unfavorably upon general packing and handling practices, with the result that comparatively few growers have been attempting to meet the demands of the fancy table-grape trade.